Name: Date:

Polynomial Factoring solution (version 46)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 43 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(43)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 172}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-72}}{2}$$

$$x = \frac{-10 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-10 \pm 6\sqrt{2}\, i}{2}$$

$$x = -5 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $8 + 4i$ and $-5 + 7i$ in standard form $(a + bi)$.**

Solution

$$(8 + 4i) \cdot (-5 + 7i)$$

$$-40 + 56i - 20i + 28i^2$$

$$-40 + 56i - 20i - 28$$

$$-40 - 28 + 56i - 20i$$

$$-68 + 36i$$

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3. **Write function $f(x) = x^3 - 4x^2 - 20x + 48$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	-4	-20	48
-4		-4	32	-48
	1	-8	12	0

$$f(x) = (x + 4)(x^2 - 8x + 12)$$

$$f(x) = (x + 4)(x - 6)(x - 2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 2)^2 \cdot (x - 3) \cdot (x - 8)^2$$

Sketch a graph of polynomial $y = p(x)$.